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Notes on the Lichen Genus *Parmeliella* in Japan

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The genus *Parmeliella* is shown to be represented by eight species in the Japanese lichen flora, none of which are common except for *P. mariana* (Fries) P.M.Jørg. & D.J.Galloway and *P. stylophora* (Vain.) P.M.Jørg. The following species are newly recognized: *P. adpressa* P.M.Jørg. sp. nov., *P. alnophila* P.M.Jørg., sp. nov, *P. asahinae* (Räs.) P.M.Jørg., stat. nov., *P. serpentinicola* P.M.Jørg. & Kashiw., sp. nov. and *P. verruculosa* P.M.Jørg., nom. et comb. nov. *P. miradorensis* Vain. is recorded as new to Japan. A key to the Japanese species is given, and the correct placement of species which previously was referred to the genus, reported.

Key words: Japan, lichens, *Parmeliella*

The genus *Parmeliella* Müll.Arg. was established mainly for pannariaceous lichens without a thalline apothecial margin, a poor taxonomic criterium, and accordingly a series of unrelated species have been incorporated in it (Jørgensen 1998), and so did also Japanese botanists, for example Kurokawa (1958) who made a survey of the genus in Japan. The following species treated by him are now considered to belong to other genera as shown in the parentheses; *Parmelia grisea* (Hue) Kurok. (= *Santessoniella grisea* (Hue) Henssen, see Henssen 1997), *Parmeliella microphylla* (Sw.) Müll.Arg. (= *Fuscopannaria leucophaea* (Vahl) P.M.Jørg., see Jørgensen 1978, 1994), *Parmeliella incisa* Müll.Arg. (= *Fuscopannaria incisa* (Müll. Arg.) P.M.Jørg., see Jørgensen 2000c) and *Parmeliella subincisa* Zahlbr. (= *Fuscopannaria subincisa* (Zahlbr.) P.M.Jørg., see Jørgensen 2000c). The status of *Parmeliella adglutinata* Asahina is uncertain as the type has not been traced, but it is likely to be a *Placynthium* as it previously was confused with *Parmeliella stenophylla* (Tuck.) Fink, which belongs to that genus.

The Japanese pannariaceous parmelielloid genera may be separated in the following way:

1. Thallus gelatinous, corticate all around, fruticolous, blackish .....*Santessoniella*
– Thallus not gelatinous, lower surface ecorticate, bluish to brownish, squamulose 2
2. Thallus mostly bluish; apothecia always without thalline margin, hymenium I + blue .....*Parmeliella*
– Thallus mostly brownish; apothecia with thalline margin, at least initially, hymenium I + blue-green, turning red-brown .....*Fuscopannaria*

In addition, the species taxonomy of the taxa remaining in *Parmeliella* is in need of revision, and an attempt to this is presented below. The methods are the same as in Jørgensen (1978) and the material originates

from the cited herbaria.

The Species

As we have only seen five species of *Parmeliella* s. str. from Japan. The genus appears to be remarkably rare, and possibly poorly collected or overlooked in this country. In addition Yoshimura (1974) include two taxa of the *Pannaria mariana* (Fr.) Müll.Arg. complex, occurring in southern Japan, which have been transferred to *Parmeliella* recently (Jørgensen 2000b), on their hymenial characters. These species are included in the key, but not described in the text, as they are recently treated by Jørgensen (2000b).

1. Thallus forming brownish, expanding, flat rosettes on prominent prothallus.....2
– Thallus of irregular, often bluish, squamules; prothallus not prominent.....5
2. Thallus thin, appressed on a crustose prothallus 3
– Thallus thicker, on a dense mat of rhizohyphae 4
3. Thallus red-brown with marginal, verrucose isidia, areolate centrally ....*P. verruculosa*
– Thallus variegated brown, without isidia... .....*P. adpressa*
4. Thallus isidiate; apothecia with isidiate margin.....*P. stylophora*
– Thallus non-isidiate; apothecia with squamulose margin .....*P. mariana*
5. Thallus thick and stiff, lobes broad (to 2 mm), brownish 6
– Thallus thinner with narrower lobes, bluish 7
6. Thallus corticolous, pale brown with dark apothecia .....*P. asahinae*
– Thallus terricolous, ferruginous with pale apothecia .....*P. serpentinicola*
7. Thallus repeatedly squamulose, flat with broad-margined apothecia..... .....*P. miradorensis*
– Thallus of squamules with convex, ascending finger-like lobes; apothecia with narrow margin .....*P. alnophila*

1. **Parmeliella adpressa** P.M.Jørg., sp. nov. [Fig. 1]

Parmeliellae marianae similis, sed thallo tenui, adpresso, variegato, margine albido, prothallo nigro, crustaceo, sporis magnis.

TYPE: Japan, Prov. Shinano, Mt. Kinpu, alt. 2100–2450 m, Y. Jinzenji 176 (TNS, holotype).

Thallus crustose, variegated, irregularly spreading, consisting of circular, thin (c 50 μm) squamules appressed onto a blackish crustose prothallus. Squamules brownish centrally with grey lobes which are distinctly white-margined, contrasting the black prothallus. All reactions negative, no lichen substances found. Apothecia common, 2 mm diam., convex with distinct, squamulose thalline margin. Hymenium I + blue; asci with amyloid apical ring-structure, 8-spored. Ascospores simple, colorless, ellipsoid, 18–25 × 9–10 μm, often broader in one end.

Note: A species of the *Parmeliella mariana* group with thalline margins around the apothecia, but unlike *Pannaria* with amyloid hymenium and asci with amyloid apical ring-structure. It is much more crustose than any taxon of this group, which we have hitherto seen with a characteristic variegated habitus because of the white-margined brownish grey squamules resting on a black prothallus. The thallus is thinner than in any other species of this group, which is normally subtropical. Also its spores are unusually large. This is the only species of the group found in the cool-temperate zone.

Habitat and distribution: Corticolous species of montane forests in the cool-temperate zone of Japan. As yet only known from the Japanese type collection.

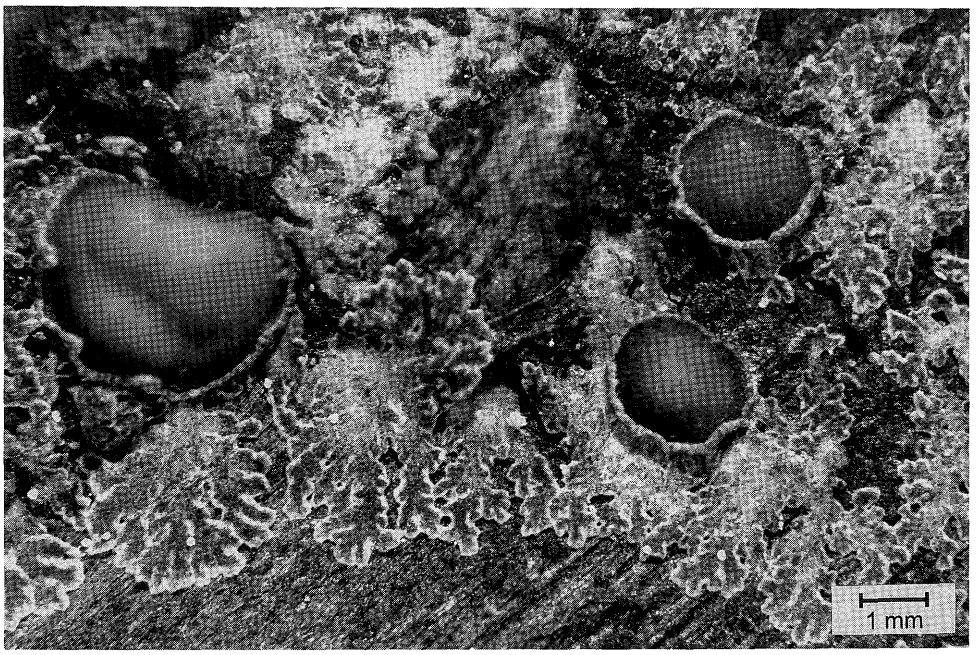

Fig. 1. *Parmeliella adpressa*, holotype.

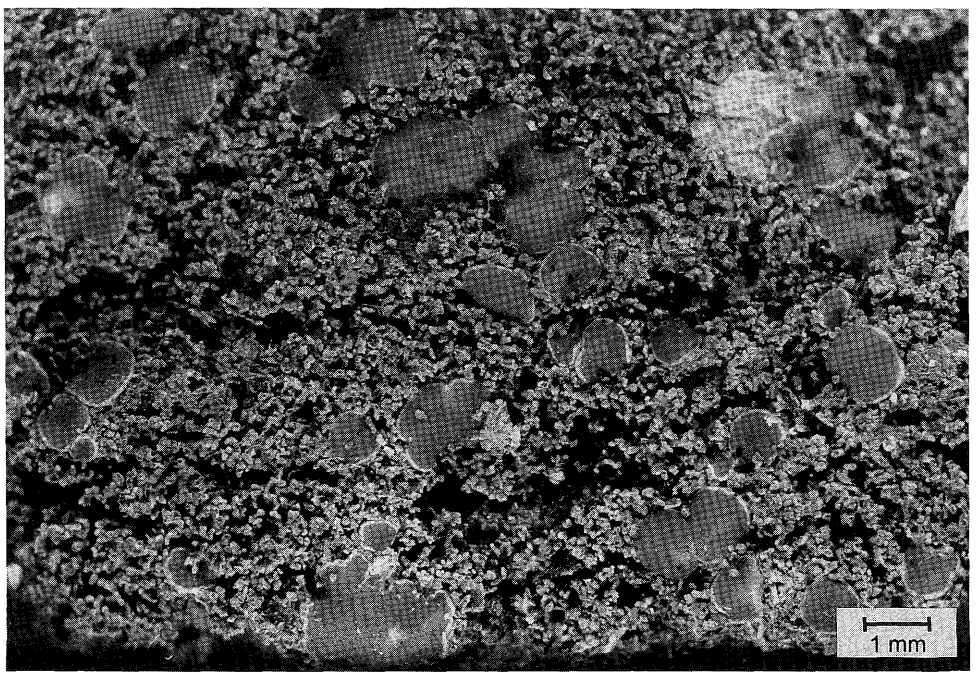

Fig. 2. *Parmeliella alnophila*, holotype

2. **Parmeliella alnophila** P.M.Jørg., sp. nov. [Fig.2]

Parmeliellae triptophyllae similis sed thallo non-isidiato et apotheciis magnis, sine hypotheciis coloratis.

TYPE: Japan, Honshu, Prov. Rikuchu, Mt. Iwate-san, Iwate-gun, alt. 1250 m, 9. Aug. 1971, H. Kashiwadani 8879 (TNS, holotype).

Thallus grey-bluish(-brown), forming irregular patches with poorly developed prothallus, squamulose, individual squamules up to 2 mm broad and 150 µm thick, with finger-like which when ascending may resemble isidia. All reactions negative; no lichen substances found. Apothecia rather common, irregular, often expanded with convex, brown disc and narrow (to 50 µm wide) proper margin and narrow (50 µm), colorless subhymenium. Hymenium I + blue. Asci with amyloid apical ring; spores simple, colorless, ellipsoid, 10–12 × 5–7 µm.

Notes: This species may be confused with *P. triptophylla* (Ach.) Müll.Arg., which is not known with certainty from Japan, and from which *P. alnophila* differs in several characters. It does not have true isidia emerging from the thallus margins, but its lobes are often reduced to isidia-like outgrowths. Best distinguished on the different, large, expanding apothecia with a narrow exciple, and the pale (not brown), narrow subhymenium. These apothecial characters indicate that *P. alnophila* is not as closely related to *P. triptophylla* as its thallus may suggest. The apothecial characters also exclude the possibility of it being an abnormally developed *P. miradorensis*. It appears closer to the Australian *P. coerulescens* Müll.Arg., which has a larger, bluer, more irregular thallus.

Habitat and distribution: As yet only known from the type collection in northern Honshu in Japan, where it, as indicated by the epithet, grows on stems of *Alnus*. It would be surprising if it does not show a wider distribution on alders in the region, though my colleague T. Tønsberg who collected on that tree in Hokkaido, did not find it.

3. **Parmeliella asahinae** (Räs.) P.M.Jørg., stat. nov.

Parmeliella nigrocinerea (Nyl.) Vain. var. *asahinae* Räs., in J. Jap. Bot. **16**: 146 (1940). [Fig.3]

TYPE: Japan, Prov. Suruga, Mt. Ashidaka, 16 Oct. 1922, Y. Asahina (H, holotype!).

Thallus gray-buff (to -blue), squamulose to subfoliose, irregularly laciniate to 3 cm diam. Lobes smooth, stiff and thick, to 250 µm, with paler ascending margins and protruding rhizohyphae, centrally more or less imbricate and narrow. Apothecia plane, pale brown with narrow proper margin; hymenium I + blue. Ascospores simple, colorless, ellipsoid, 11–15 × 6–7 µm.

Notes: To judge from the crumbling type specimen of *P. nigrocinerea* (H-Nyl.), this new taxon is not so closely related to it, as believed by Räsänen (1940: 146), but instead to the Southern Hemispherical *Parmeliella granulata* Lamb, from which it mainly differs in having a smooth upper surface.

Habitat and distribution: Mainly corticolous species, often overgrowing bryophytes in warm-temperate forests of Japan from where it is only known in few collections; obviously a rare and local species.

Specimens examined: Japan, Prov. Yamato, Ohdaigahara Mts, Mt. Hinode-dake, 29 July 1955, M. Togashi (TNS).

4. **Parmeliella miradorensis** Vain. in Dansk Bot. Arkiv **4**: 16 (1926). [Fig. 4]

TYPE: Mexico, Mirador, March 1842, F. M. Liebman 7376 (TUR, lectotype, fide Jørgensen 2000a: 143).

Parmeliella nigrocincta auct., non sens. orig.

Thallus squamulose, forming irregular, wide spreading rosettes resting on a thin, blackish prothallus. The thin, to 100 µm,

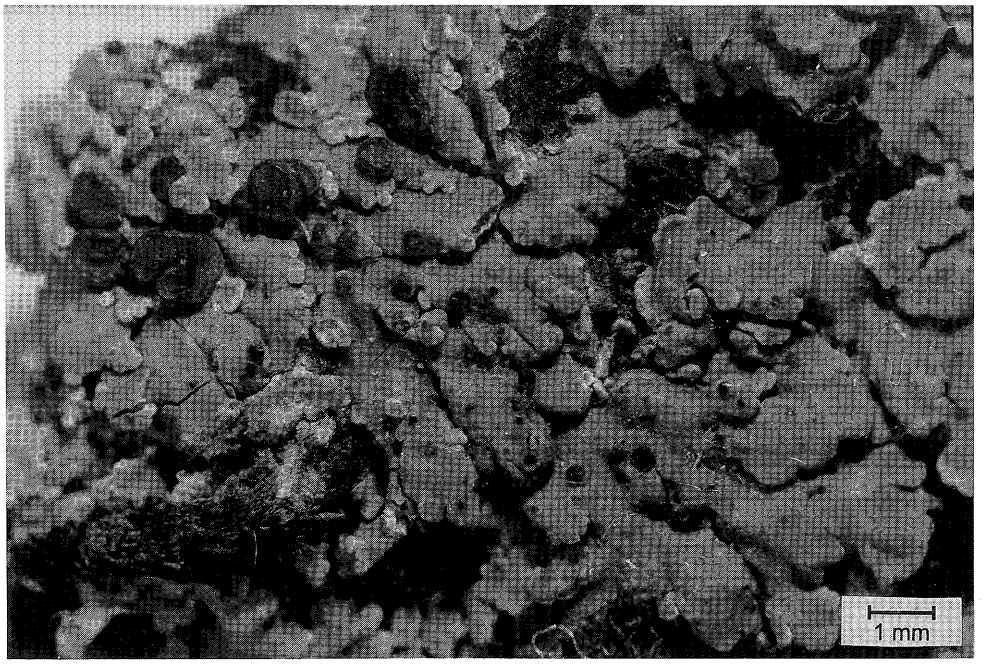

Fig. 3. *Parmeliella asahinae*, holotype.

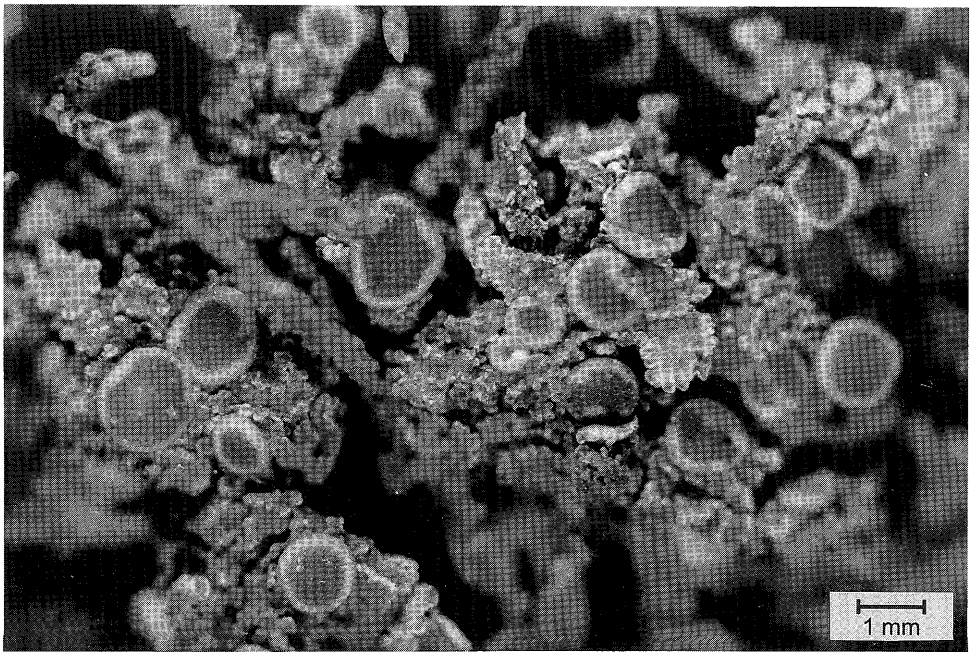

Fig. 4. *Parmeliella miradorensis*, specimen from Hokkaido.

gray-blue to -brownish squamules are frequently imbricating and often produce secondary lobules on the margins. Apothecia usually common, to 1.5 mm, reddish brown with distinct, paler, broad, to 150 μm, paraplectenchymatous proper margin. Hymenium I + blue; ascospores simple, hyaline, smooth, ellipsoid, 11–17 × 6–8 μm.

Note: Like elsewhere, this species was mistaken for the different *P. nigrocincta*, which is restricted to the southern parts of the southern Hemisphere (see Jørgensen 2000a). It differs in the thinner, less waxy, lobulate thallus and the smaller, smoother spores.

Habitat and distribution: Widespread, corticolous species in temperate forests, reaching as far North as Hokkaido in Japan. Also widespread in the world being present in Central and South America, the West Indies and the Macaronesian islands.

Selected specimens examined: Hokkaido, Prov. Kitami, Esashi-gun, Hamatonbetsu-cho, between the road and Usotan-gawa stream, just S of the road, alt. 50 m, 5. June 1995, T. Tønsberg 22647–48 (BG). Prov. Kushiro, around small bridge across Shirikomabetsu River, Akan-cho, Akan-gun, alt.450 m, 9. Sept. 1995, Y. Ohmura & H. Kashiwadani (TNS). Prov. Tokachi, Kato-gun, Kamishihoro-cho, just W of road 273, 6 km south of Mikuni tunnel through Mt. Mikuni-yama, alt. 680 m, 9. June 1995 , T. Tønsberg 23053 (BG).

5. **Parmeliella serpentinicola** P.M.Jørg. & Kashiw., sp. nov. [Fig. 5]

Parmeliellae cineronigrae similis sed thallo ferrugineo et apotheciis pallidis.

TYPE: Shikoku, Pref. Kochi, Mt. Shiraga, en route from Fuyunose to the summit of the mountain, alt. 1100–1470 m, on serpentine rock, 2. Nov. 1974, H. Kashiwadani 12601 (TNS, holotype).

Thallus rusty-brown, squamulose, to 3 cm diam. Lobes shallowly incised, broad, to 3 mm, smooth, but marginal ones somewhat pruinose, thick, to 300 μm. Prothallus pro-

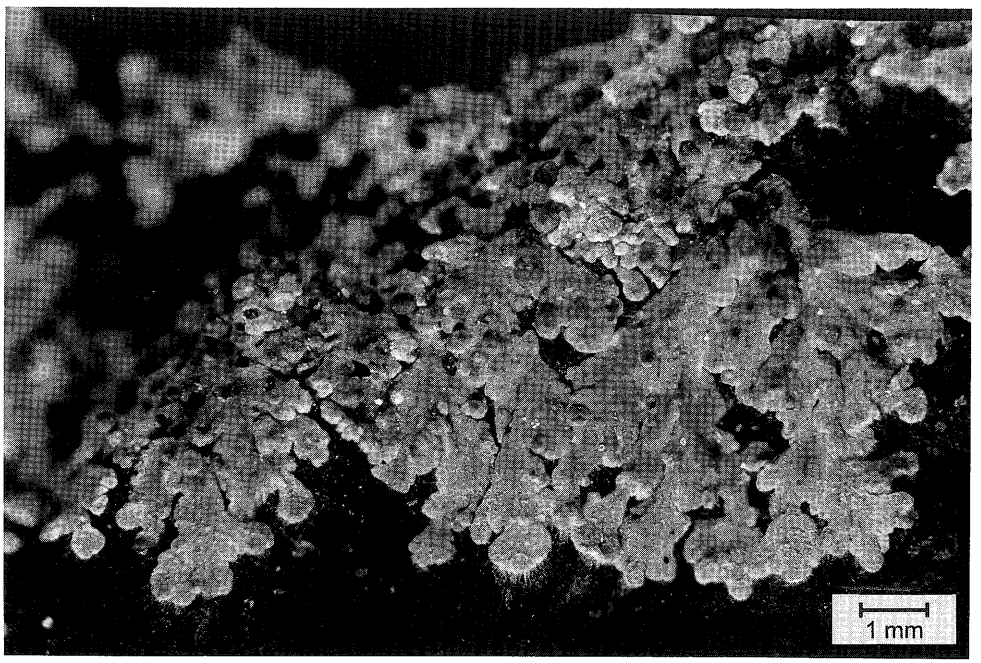

Fig. 5. *Parmeliella serpentinicola*, holotype.

truding. Apothecia not known in mature state, pale brown, slightly convex when young. Hymenium I + blue; no ripe spores observed, but young ones simple and colorless.

Notes: Due to the poor state of the type specimen of *P. nigrocinerea*, it is difficult to evaluate how closely related *P. serpentini-*

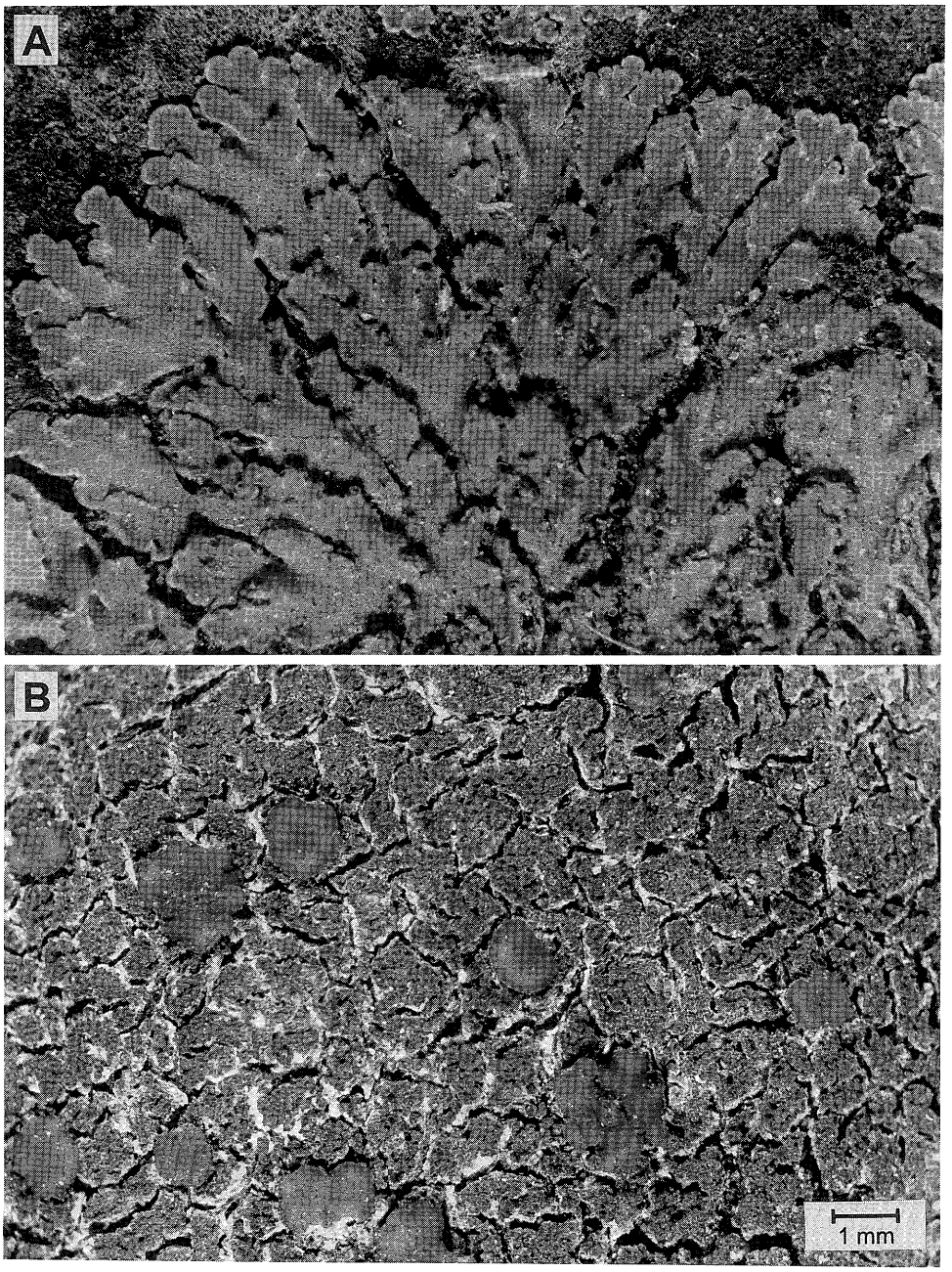

Fig. 6. *Parmeliella verruculosa*. A. marginal lobes, B. central, areolate parts with apothecia.

cola is to that species. The young apothecia lack the black pigmentation of *P. nigrocinerea*, and the ferruginous thallus color is at variance with the gray-brown of *P. nigrocinerea*. Both species are terricolous, a rather unusual habitat for this genus. *Parmeliella serpentinicola* may, as indicated by the name, be one of those organisms that are adapted to ultrabasic rocks.

Habitat and distribution: Terricolous species, probably confined to ultrabasic soil. Only known from the type collection at the moment, and certainly occurring scattered due to its habitat requirements, possibly a narrow endemic.

6. **Parmeliella verruculosa** P.M.Jørg., nom. & stat. nov. [Fig. 6]

Based on *Parmeliella nigrocincta* (Mont.) f. *isidiosa* Kurok. in J. Jpn. Bot. **33**: 118 (1958).

TYPE: Japan, Prov. Sagami, lakeside of Asinoko, 10. Nov. 1956, Y. Asahina (TNS, holotype!).

Thallus red-brown, often covering large areas, consisting of appressed, thin (to 100 μm) squamules, to 3 cm diam., with distinct, enlarged peripheral lobes resting on a distinct, crustose, blackish prothallus. Particularly in central parts beset with marginal verruciform isidia, in large specimens often broken up in areolate patterns centrally. All chemical reactions negative; no lichen acids found. Apothecia to 2 mm diam, brown, convex, adnate. Hymenium I + blue. Asci with apical amyloid tube. Ascospores simple, colorless, ellipsoid, 12–16 × 6–7 μm.

Note: We have chosen to rename this characteristic species, as allowed by the Code, in order to avoid any confusion with *Pannaria isidioidea* (Müll.Arg.) Vain., which in fact is a *Parmeliella. Parmeliella verruculosa* is not closely related to *P. nigrocincta* which is a Southern Hemispherical species with a rather thick crustose, wax-like thallus (Jørgensen 2000a). It appears to be closer related to *P. pannosa*, though with a thinner, more appressed thallus with verrucose isidia, rather than flattened lobules.

Habitat and distribution: *P. verruculosa* is a corticolous species, growing on smooth bark in the warm-temperate forests of southern Japan and Formosa. It may prove to have a wider distribution in such forests in South-East Asia.

Specimens examined: JAPAN. Honshu. Prov. Shinano, Otikura, Hakuba-mura, 6. Aug. 1957, Y. Asahina & M. Togashi (TNS). Kyushu. Prov. Higo, Amakusa-gun, Tomioka, Tomoesaki, 27. Nov. 1959, Y. Asahina & M. Togashi (TNS). Prov. Ohsumi, Yaku island, Kurio, alt.100 m, 28. July 1979, H. Shibuichi 5920 (TNS). FORMOSA: Taitung Pref., Chinsueiin Pass, alt. 1200–1600 m, 11. Feb. 1965, S. Kurokawa 3001 (TNS).

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References

Henssen A. 1997. *Santessoniella*, a new cyanophilic genus of lichenized ascomycetes. Symb. Bot. Ups. **32**: 75–93.

Jørgensen P. M. 1978. The lichen family Pannariaceae in Europe. Opera Botanica **45**, 123 pp.

—— 1994. Studies in the Pannariaceae VI: The taxonomy and phytogeography of *Pannaria* s. str. J. Hattori Bot. Lab. **76**: 197–206.

—— 1998. Studies in the Pannariaceae VII: On some poorly known *Parmeliella*-like species from the southern Hemisphere. Lichenologist **30**: 533–541.

—— 2000a. New or interesting *Parmeliella* species from the Andes and Central America. Lichenologist **32**: 139–147.

—— 2000b. The lichen family Pannariaceae in America, North of Mexico. The Bryologist **103**: 99–110.

—— 2000c. Notes on some East-Asian species of the lichen genus *Fuscopannaria*. J. Hattori Bot. Lab.

89: 247–259.
Kurokawa S. 1958. Notulae miscellanea lichenum japonicorum (4). J. Jpn. Bot. **33**: 116–119.
Räsänen V. 1940. Lichenes ab A. Yasuda et aliis in Japonia collecti II. J. Jpn. Bot. **15**: 139–153.
Yoshimura I. 1974. Lichen flora of Japan in colour. 349 pp. Hoikusha Publ., Osaka.

P. M. ヨルゲンセン[a], 柏谷博之[b]：**日本産シコロゴケ属**

日本産シコロゴケ属の分類学的検討を行い，*Parmeliella adpressa* P.M.Jørg.（ウスバシコロゴケ，新称），*P. alnophila* P.M.Jørg.（イワテシコロゴケ，新称），*P. asahinae* (Räs.) P.M.Jørg.（アシダカシコロゴケ），*P. serpentinicola* P.M.Jørg. & Kashiw.（シラガシコロゴケ，新称），*P. verruculosa* P.M. Jørg.（トゲシコロゴケ），*P. miradorensis* Vain.（クロブチシコロゴケ）の6種を報告した．何れの種も分布が極めて限られている稀種である．なお，日本産シコロゴケ属は *P. mariana* (Fr.) P.M.Jørg. と *P. stylophora* (Vain.) P.M.Jørg. の2種をあわせて8種となる．

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